

CLAIMS

1. A laminate, characterized in that it comprises the following features:
 - at least one layer comprising a resistance element (1);
 - at least one layer formed of a fibre reinforced thermoplastic mat (2);in which the resistance element (1) and the fibre reinforced thermoplastic (2) are laminated under pressure, preferably by vacuum moulding, and that the thermoplastic is melted under heat and then cooled so that the resistance element is completely or partly enclosed by thermoplastic and consolidated as a laminate.
2. Laminate according to claim 1, wherein the resistance element (1) and the fibre reinforced thermoplastic layer (2) adhere to each other during the moulding process.
3. Laminate according to claim 1, wherein the laminate comprises at least two layers (2,3) of fibre reinforced thermoplastic, and in which the resistance element (1) is arranged between the two fibre reinforced thermoplastic layers (2,3).
4. Laminate according to claim 1, wherein said laminate further comprises at least one sandwich core (4) and at least one additional fibre reinforced thermoplastic layer (5), so as to form a structural element.
5. Laminate according to claim 1, wherein the mould comprises at least one plate (6) which forms a base for the various layers in the laminate during the moulding process.
6. Laminate according to claim 5, wherein the material in the plate (6) is metal, a carbon composite or another material or combination of materials which are thermally conductive.
7. Laminate according to claim 5, wherein the first fibre reinforced thermoplastic layer (2), the resistance element (1) and the second fibre reinforced thermoplastic layer are arranged on the plate (6) during the moulding process.

8. Laminate according to claim 5, wherein the plate (6) forms a part of the finished laminate.
9. Laminate according to claim 1, wherein the resistance element (1) is arranged for emitting heat energy so that the melting process is supplied with heat from within.
10. Laminate according to claim 1, wherein the resistance element (1) comprises at least one elongate resistive wire (10) and wherein each resistive wire is provided with two terminals (20, 21) for connection to electric supply cables (30, 31).
11. Laminate according to claim 10, wherein at least one resistive wire (10) is arranged in a pattern on an area.
12. Laminate according to claim 10, wherein the resistive wire (10) has been imprinted or etched directly onto the thermoplastic layer (2), which preferably is a partly consolidated fibre reinforced thermoplastic textile.
13. Laminate according to claim 1, wherein the electric supply cables (30, 31) extend outside the laminate.
14. Laminate according to claim 1, wherein at least one temperature sensor (40) is arranged within the laminate.
15. Laminate according to claim 10, wherein the temperature sensor is arranged within the laminate and close to the resistive wire (10), so that the melting process which is supplied with heat from the resistance element (1) may be controlled with regard to the temperature.
16. Laminate according to claim 1, in which the resistance element is present as a silk screen imprinted or photo-engraved resistance element (1) comprising a resistive wire (10) in an insulating matrix (50).

17. Laminate according to claim 1, wherein the fibre reinforced thermoplastic mat includes non-conductive reinforcement filaments (26), preferably of glass fibre filaments.

18. Laminate according to claim 9, wherein the resistance element (1) comprises at least one elongate resistive wire (10) arranged in a pattern which forms a preferably closed electric circuit, and in which the resistance element is arranged for external supply of electric energy via induction.

19. A method for manufacturing a fibre reinforced laminated resistance element, characterized in that it comprises the following steps:

- arranging at least one resistance element (1) together with at least one layer of a mat (2) of reinforcement fibres (25) and thermoplastic fibres (26) in a mould;
- moulding the resistance element (1) together with the fibre reinforced thermoplastic layer (2) under heat so that the thermoplastic fibres (26) melt and fill the fibre reinforcement (25), and under pressure, preferably by vacuum moulding, so that they together form the fibre reinforced laminated resistance element.

20. Method according to claim 19, which further comprises the following step:

- supplying energy to the moulding process completely or partly by means of the resistance element (1) itself which is to be moulded into the laminate.

21. Method according to claim 19, wherein the resistance element (1) is formed by etching of a metal film onto a layer comprising thermoplastic.

22. Method according to claim 19, wherein the resistance element (1) is formed by etching of a metal film onto a glass fibre reinforced layer of thermoplastic.

23. Method according to claim 19, wherein the mould comprises at least one plate which forms a base for the various layers in the laminate by moulding.

24. Method according to claim 23, wherein the plate is integrated in the laminate during the moulding process so as to form a part of the laminate.